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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/740,299	12/19/2000	Yrjo Keranen	4925-95	7221

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EXAMINER

MEHRPOUR, NAGHMEH

ART UNIT	PAPER NUMBER
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2686

DATE MAILED: 04/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/740,299

Applicant(s)

KERANEN

Examiner

Naghmeh Mehrpour

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 28 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-20, are rejected under 35 U.S.C. 103(a) as being unpatentable over Keranen et al. (US Patent 6,681,099 B1) in view of Uechara (US Patent Number 6,477,380 B1).

Regarding claim 1, Keranen teaches a method for determining a geographic location of user equipment via a location service server in a wireless network, comprising the steps of:

(a) determining a value of the transmission timing delay of the user equipment (col 3 lines 20-25);

(b) measuring a round trip time of a radio signal between a connected transceiver node and the user equipment (col 3 lines 55-57), wherein the connected transceiver node is in active communication with the user equipment (col 5 lines 1-20);

(d) calculating a distance between the user equipment (UE) and the connected transceiver node and between the user equipment and each of the at least one other transceiver node using the transmission timing delay determined in said step (a) (col 4 lines 52-62); and

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(e) determining the location of the user equipment using the distances calculated in said step (d) (col 4 lines 50-62).

Keranen fails to teach a method wherein c) measuring a round trip time of a radio signal between at least one other transceiver node and the user equipment, wherein the at least one other transceiver node is not connected to the user equipment. However Uechara teaches a method wherein c) measuring a round trip time of a radio signal between at least one other transceiver node and the user equipment, wherein the at least one other transceiver node is not in active communication the user equipment (col 10 lines 62-56, col 11 lines 1-23). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the above teaching of Uechara with Keranen, in order to locate the mobile based upon a point or several points given by the circles defined using the distances.

Regarding claim 2, Keranen teaches a method wherein said step (a) comprises determining the transmission timing delay by using the connected transceiver node to query the user equipment (col 4 lines 30-51).

Regarding claim 3, Keranen teaches a method wherein said step (a) comprises determining the transmission timing delay by setting the transmission timing delay to equal a default value $T_{sub.0}$ (col 2 lines 12-25).

Regarding claim 4, Keranen teaches a method comprising the step of requesting a connection between the user equipment and a selected transceiver node before said step (a) if the user equipment is not connected to any transceiver node (col 4 lines 9-15, when the UE handoffs to the new node, it connects to the new node and disconnect from the old node), and

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connecting the selected transceiver node with the user equipment so that the selected transceiver node comprises the connected transceiver node (col 4 lines 9-19).

Regarding claim 5, Keranen inherently teaches a method wherein said step of requesting a connection comprises requesting, by the selected transceiver node, a return trip time measurement via a random access channel to connect the user equipment to the selected transceiver node. Examiner explains that when a mobile attempts to access a system, however, such propagation delay information typically is unavailable (the node is not connected).

Accordingly, conventional time-division-multiplexed systems commonly utilize a random access channel (RACH) to receive an access request burst from the mobile unit and use propagation delay gained from the received RACH burst to determine an appropriate timing advance for the terminal. Upon powering up or handoff to a new base station, the mobile searches for and receives a control channel from the base station that provides an initial timing reference. To initiate use of the base station, the mobile unit then transmits a RACH burst at a predetermined time in relation to the control channel timing reference. Upon receipt of the RACH burst, the base station can determine round-trip time delay based on the delay between the transmission of the control channel timing reference and the receipt of the RACH burst. The base station uses this round-trip time delay to determine an appropriate timing advance for the mobile unit (see cited reference Asokan US Patent Number 6,663,559).

Regarding claim 6, Keranen teaches a method wherein said step (c) comprises comparing a time-of-arrival of an uplink transmission from said UE at the non-connected (see rejection of claim 5) transceiver nodes to the time-of-arrival of the uplink transmission at the connected transceiver node, and

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determining the propagation time of each of the non-connected transceiver nodes (see claim 5, for non-connected node) therefrom (col 5 lines 5-25).

Regarding claim 7, Keranen fails to teach a method wherein c) measuring a round trip time of a radio signal between at least one other transceiver node and the user equipment, wherein the at least one other transceiver node is not connected to the user equipment. However Uechara teaches a method wherein c) measuring a round trip time of a radio signal between at least one other transceiver node and the user equipment, wherein the at least one other transceiver node is not in active communication with to the user equipment (col 10 lines 63-67, col 11 lines 1-23). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the above teaching of Uechara with Keranen, in order to locate the mobile based upon a point or several points given by the circles defined using the distances.

Regarding claims 8,18, Keranen teaches a method wherein said step (e) comprises determining the user equipment location by mathematically generating a circle around the connected transceiver node and each of the at least two other transceiver nodes (col 5 lines 25-34), wherein the radius of each circle is the distance of the user equipment to the respective transceiver node determined in said steps (c) and (d), and determining an intersection of the circles (col 5 lines 34-35).

Regarding claim 9, Keranen teaches a method wherein said step of determining the intersection of the circles comprises iteratively increasing or iteratively decreasing the radii of each of the circles until an intersection point is determined (col 5 lines 54-67, col 6 lines 1-8). There are certain

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situations when the UE timing difference $t_3 - t_2$ may be different from the defined value. These situations occur when the UE is moving toward or away from a node or BTS, the propagation paths are varying, and there is a soft handover in which a UE is switched from one cell to another (col 4 lines 1-15). Therefore, for determining the intersection of the circles comprises iteratively increasing or iteratively decreasing the radii of each of the circles until an intersection point is determined.

Regarding claim 10, Keranen teaches a method wherein said step (e) comprises determining the user equipment location by mathematically generating a circle around the connected transceiver node and each of the at least one other transceiver node (col 5 lines 25-34), wherein the radius of each circle is the distance of the user equipment to the respective transceiver node determined in said step (d) (col 5 lines 25-34), and determining an angle of arrival radio steps (col 5 lines 53-67, col 6 line 1), and (d) at the connected transceiver node and the at least one other transceiver node (col 6 lines 1-3).

Regarding claim 11, Keranen teaches a method wherein said step (b) further comprises determining a sector of the area of coverage of the connected transceiver node in which the user equipment is located (col 5 lines 54-62).

Regarding claim 12, Keranen teaches a method wherein said step (c) further comprises searching, by the at least one other transceiver node (base station), within the sector determined in said step (b) (col 5 lines 58-67, col 6 lines 1-8). Examiner explains that when a mobile attempts to access a system. Accordingly, conventional cellular system searching for a new node

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/new base station upon powering up or handoff to a new base station, the mobile searches for and receives a control channel from the base station.

Regarding claim 13, Keranen teaches a method wherein said steps (a)-(e) are performed in response to receiving a request for the location of a user equipment (col 4 lines 30-51).

Regarding claim 14, Keranen teaches a wireless communication system comprising a core network (col 3 lines 20-25),

a plurality of radio network controllers (col 3 lines 36-39),

a plurality of wireless transceiver nodes for communicating with a user equipment located in a geographical area supported by said transceiver nodes (col 3 lines 29-36), and

a location services server for determining a location of the user equipment (Mobile terminal), said location services server (col 3 lines 20-25) comprising:

means for determining a round trip time for a radio signal from between a user equipment and a connected transceiver node in communication with the user equipment including means for measuring a time from a beginning of transmission of a downlink transmission signal from the connected transceiver node to the reception of an uplink transmission signal from the user equipment to the connected transceiver node in response to the downlink transmission signal (col 3 lines 62-65);

means for determining a round trip time between the user equipment (UE) and at least one other non-connected transceiver node, which is not in communication with the user equipment (col 4 lines 2-5). The time difference $t_3 - t_2$, are the time that UE requires between receiving the downlink

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transmission and transmitting the uplink at this time node is not in communication with the UE yet;

means for determining a location of the user equipment from the distances of the user equipment from each of the nodes (col 4 lines 2-51). Keranen fails to teach a method wherein measuring a round trip time of a radio signal between at least one other transceiver node and the user equipment, wherein the at least one other transceiver node is not connected to the user equipment. However Uechara teaches a method wherein c) measuring a round trip time of a radio signal between at least one other transceiver node and the user equipment, wherein the at least one other transceiver node is not connected to the user equipment (col 10 lines 63-67, col 11 lines 1-23).. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the above teaching of Uechara with Keranen, in order to locate the mobile based upon a point or several points given by the circles defined using the distances.

Regarding claims 15,17, Keranen teaches a wireless communication system wherein said means for determining a round trip time between the user equipment and plurality of other non-connected transceiver node comprises means for receiving an uplink transmission signal from the user equipment at the at least one other non-connected (during the handoff) transceiver node which is not in active communication with the user equipment and means for comparing the reception times at the at least one other non-connected transceiver node with the reception time at the connected transceiver node (col 3 lines 38-57, col 4 lines 2-22).

Regarding claim 16, Keranen teaches a wireless communication system further comprising means for determining an angle of arrival (AOA) of transmission

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signals at the connected transceiver node in active communication and the at least one other transceiver node (col 5 lines 65-67, col 6 lines 1-9).

Regarding claim 19, Keranen teaches a wireless communication system further comprising means for determining whether the radii determined are one of too large and too small (col 4 lines 9-22, col 5 lines 25-35). In order to generate a circle around each of the active nodes and calculates the intersection of the circles, when the UE is moving toward or away from the node or BTS the propagation path are varying, and there is a soft handover in which UE is switched from one cell to another. During the movement of the UE toward or away from the BTS the propagation delay between t_1 and t_2 changes. The amount that t_3 can change in each increment is limited, if the movement is too fast, the UE is prevented from adjusting the t_3 time fast enough because of the increment limit. Therefore, the radius that determined at t_3 is either too small or too large.

Regarding claim 20, Keranen teaches a wireless communication system wherein said means for determining a location comprises means for iteratively decreasing the radii until an intersection point of the circles is found when the radii are too large and means for iteratively increasing the radii until an intersection point of the circles is found when the radii are too small (col 5 lines 25-35). There are certain situations when the UE timing difference $t_3 - t_2$ may be different from the defined value. These situations occur when the UE is moving toward or away from a node or BTS, the propagation paths are varying, and there is a soft handover in which a UE is switched from one cell to another (col 4 lines 1-15). Therefore, during the process of determining an intersection of the circles, the radius of the

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circles are either too large or too small until the exact point of the intersection of the circles is found.

Response to Arguments

3. Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

4. **Any responses to this action should be mailed to:**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Naghmeh Mehrpour whose telephone number is 703-308-7159.

The examiner can normally be reached on 8:00- 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha Banks-Harold be reached (703) 305-4379.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

NM

April 1, 2005


MELODY MEHRPOUR
PATENT EXAMINER

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